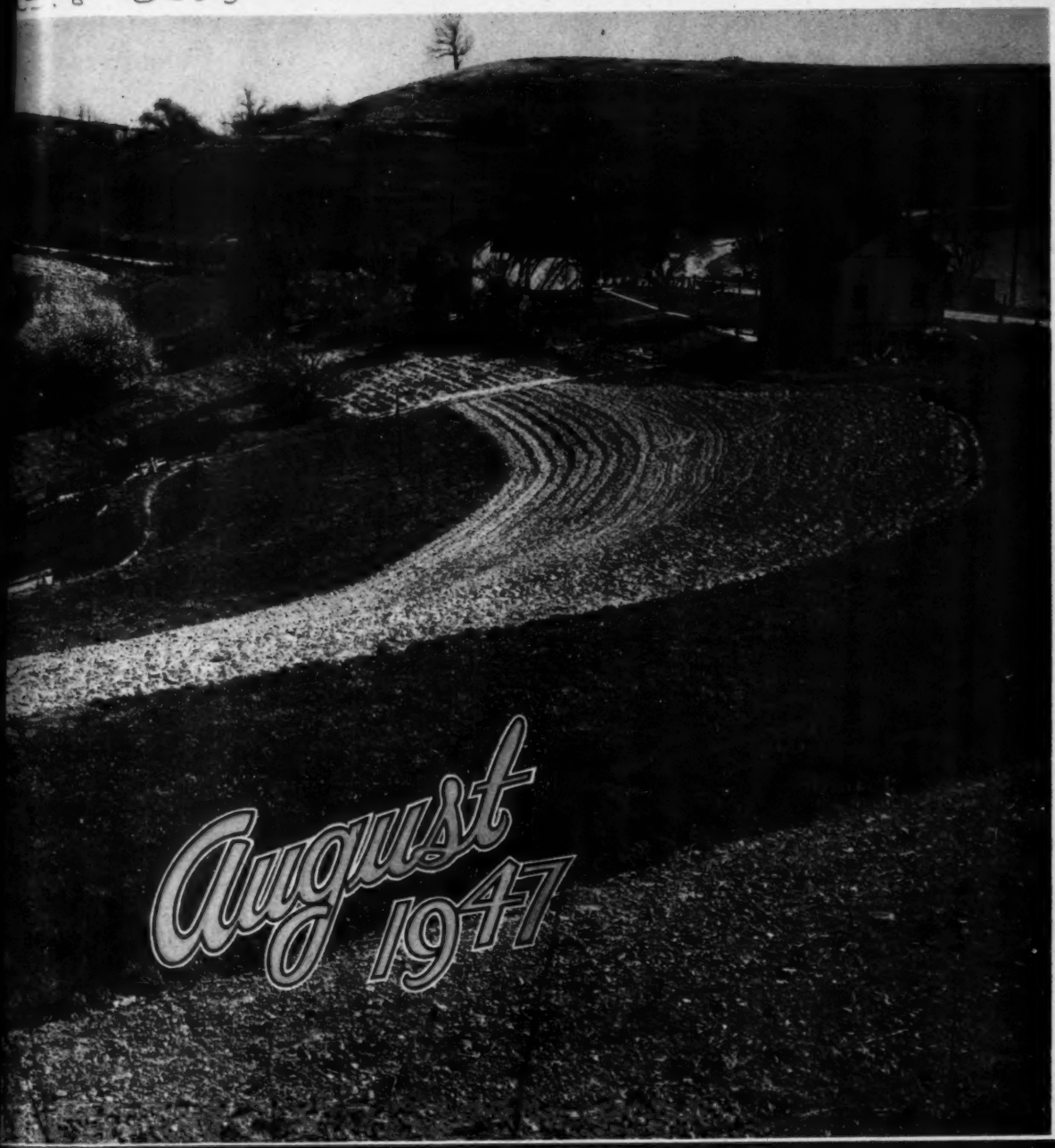

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In this Issue—

WELLINGTON BRINK
Editor
Art Work by
W. HOWARD MARTIN

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business, with approval of the Director of the Budget. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

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AIRGOING BEAVERS.—In the mountainous parts of the West, the best summer forage was once produced in mountain meadows. In many places, misuse of such meadows caused gullies to form down the middle of productive areas. The gullies lowered the water table, changed the damp area to a dry one, and invited the invasion of sagebrush and other worthless shrubs.

The way to renew production is to dam up each such gully and raise the water table. Mountain meadows, however, are usually small and inaccessible, making the cost of man-made dams more than is justified by the returns. A solution that applies, where a gully contains a permanent flow of water and plenty of willows or aspen, is to forget about human engineering and the cost of cement and labor and go back to Nature by introducing beavers. Beavers use local materials and work for far less than the prevailing wage scale. They are not much on design, but are experts on maintenance.

In parts of central California beavers have made themselves unpopular by damming up irrigation and drainage ditches and digging holes through dikes. In some of the soil conservation districts in San Diego County there are gullied meadows, but no beavers. Therefore, the California Division of Fish and Game, cooperating with soil conservation districts and the Soil Conservation Service, decided to bring the beavers and the gullies together. Into the Julian Soil Conservation District, eight beavers were

(Continued on p. 6)

THE COVER.—Herman Postlethwaite went to his home state of West Virginia to photograph this inviting scene of a happy homestead. The Farm of Frank Jack Orom, located in the Northern Panhandle Soil Conservation District, is neither spectacular nor unusual these days. It runs to a conservation pattern. In the foreground we see freshly plowed contour strips; a little farther back a hint of orchards and berries also on contour. That looks like one of the new and very popular fish ponds, just beyond the barn. Soil conservation, as typified here, adds both security and satisfaction to country living.

All orders go to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

a Plan on EVERY FARM

Behind Ronald B. Elmes, district conservationist, and Omar Spencer, chairman, stand A. N. Scritsmeir, secretary; Louis Minoggio, farmer; Kirby E. Brumfield, work unit conservationist; Paul Reeder, drainage district supervisor; John B. Galloway, supervisor; Boy Scout members of Sauvie 4-H Club; Earl C. Nichols, supervisor, and Frank G. Patterson, supervisor. Another supervisor, Carl Keller, was absent.

By HERBERT R. N. BODDY

TO THE SAUVIE Island Soil Conservative District goes the distinction of being the first district in the country with 100 percent farm planning. By the fall of 1946 the board of supervisors was able to announce that all 96 district farmers, operating 16,726 acres, had a farm conservation plan working for them. That is a record that will stand until challenged.

"Our best soil conservation advertising is a complete land-use plan in operation," says Omar Spencer, chairman.

The little farming community of Sauvie Island, located 8 miles down the Columbia River from Portland, Oreg., is only a dot on the map. For more than a century dairying has been the island's chief enterprise.

Today Sauvie farmers are turning thousands of acres of drained lake-bottom land to the production of record cash crops.

NOTE.—The author is in the current information section, Pacific Coast Region, Soil Conservation Service, Portland, Oreg.

Says Spencer, "When farmers reported good results from complete land use plans their neighbors requested similar plans. By citing nearby examples of successful farm practices we spread the gospel of soil conservation to every farm in the district. We won the doubting Thomases over by showing them, by actual practice, that conservation farming is best."

What to do about their problem of excess water was the question before the Sauvie supervisors when they gathered for a roundtable meeting 2 years ago. Technicians of the Soil Conservation Service explained that drainage of the island's wet lands was prerequisite to getting other appropriate practices applied to the land.

How the district supervisors and farmers worked out the water problem is a prime example of district teamwork.

Until 1940, when 16 miles of dikes were built along the banks of the Columbia River and Multnomah Channel by the United States Engineers, three-fourths of the island's surface had been washed by seasonal silt-laden floods.

High waters reached their peak during spring freshets when the rising Columbia and Williamette rivers flooded much of the island's pasture land.

There were times when water on the ponded pastures was too high for grazing. On these occasions Sauvie dairymen moved their herds off the island to forage on the mainland.

Around 312,700 cubic yards of ditch banks were leveled under the district program. The ditches spill into the 8-mile-long Gilbert River, main outlet. Kirby E. Brumfield, work unit conservationist, stands here on banks.

Four years later, when the Sauvie Island landowners organized the soil conservation district, the surplus water problem was only partially solved. The levees protected the land from floods and the ditching job done by the Sauvie Island Drainage District helped drain it. Still, around two-thirds of the district continued to be either under water or waterlogged.

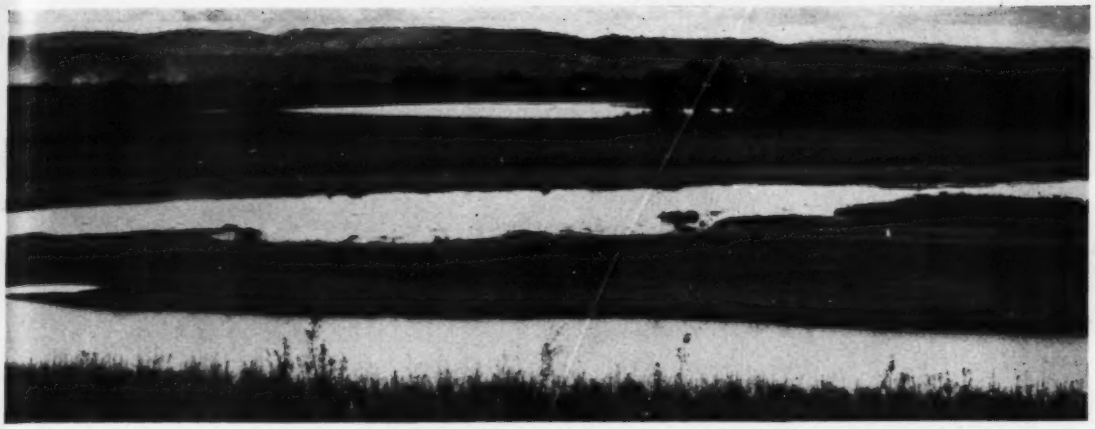
Working side by side with the supervisors, Service technicians outlined an over-all drainage program.

The farm drainage plans fitted into the over-all district work program. They also matched the pattern of the drainage districts.

On Sauvie Island, the drainage districts' main job is to keep the two main waterways clear—the 5-mile A–1 canal, the 8-mile Gilbert River, and other small main drains. The drainage districts, also undertake to drain farm lakes when the water has a depth of 5 feet or more.

All other farm drainage work in the district is

Dill, cabbages, and sweet corn supersede tules and swales on Tony Pastorino's 311-acre farm. Two hundred crates of cabbages is pretty good for first year the land was used (1946), think Pastorino and District Conservationist Elmes.



Ponds and swales waterlogged two-thirds of Sauvie Island before the coming of the soil conservation district.

handled by the farmers as part of their farm conservation plans.

Farmers are assessed by the drainage district for their portion of the over-all district drainage cost. They are on a pay-as-you-go basis.

Work of the Sauvie Island Soil Conservation District and drainage districts is closely coordinated. All phases of the island's drainage problem are worked out cooperatively with supervisors of the soil conservation district and the drainage districts.

Service engineers laid out individual drainage plans as an integral part of each farm-conservation plan. They showed farmers how to construct ditches and how to use them to dry up lakes and wet lands.

Using equipment rented from the district office, Sauvie farmers completed 77 miles of ditches and drained around 10,000 acres of lowland by June 1946.

Drainage is not the only use that farmers make of their ditches. Service technicians showed them how they could use them for irrigation.

It was demonstrated, for instance, that a 10,000-acre area could be drained by tapping the four fresh-water inlets built into the levees. The main island waterways carry the water to the farm ditching systems.

Farm land went up in value from $75 to $200 per acre after the drainage program got under way. But the change in agriculture is even more significant.

"Last summer's crop and dairy output was the island's best," explains Ronald B. Elmes, district conservationist. "Top yields were the general rule and many truck crops were raised on Sauvie Island for the first time in 1946."

Elmes said 3 to 4 tons of cabbages were the average output before the district was formed. Last summer more than 10,000 tons went to market. The sweet corn crop was stepped up seven times and production of potatoes was doubled.

Peppers, cauliflower, green onions, peas, and cucumbers were raised for the first time. The crop of cucumbers was 1,400 tons. Green peas average 1¾ tons per acre.

Dairying also improved. Drainage of old pasture land and the addition of new fields put the dairy farms on a sound basis. Herds are now sustained on less acreage due to use of better pasture management and seeding of improved grasses and legumes.

"The upswing in agricultural products on Sauvie Island has yet to reach its peak," Elmes said. "Our technicians have told the farmers that they may expect further increases in crop production next year and for some time to come. The farmers understand that production will increase as they continue to apply the practices set forth in their farm conservation plans."

Along with the drainage assistance given the district supervisors, Service technicians have helped farmers apply needed soil-improvement practices.

High on the list of practices carried out by Sauvie farmers under their complete land-use plans is their record in spoilbank spreading. Farmers have leveled a total of 312,700 cubic yards of

ditch banks. Fifteen miles of ditches have been seeded.

District teamwork is spotlighted in the following 2-year work summary:

Crop residue management, 6,780 acres; irrigation systems installed, 3,377 acres; noxious weed control, 6,330 acres; approved crop rotation, 3,140 acres; seeding of grasses and legumes, 937 acres. Fertilization, land leveling, and cover cropping round out the list of practices.

For the most part the practices applied by Sauvie farmers have been established on drained lake beds or waterlogged land.

Drainage continues to be the district's No. 1 job. Sauvie farmers apply agronomic practices as fast as they can work their drained lands. They expect these land-building and soil-improvement practices to be in full force less than 2 years hence.

"Our supervisors," noted Spencer, "follow the policy of giving assistance to district members when it is needed. We go out on the ground with Service technicians, and talk things over with the farmer. We make a point to understand his soil-conservation problems."

The Sauvie board of supervisors have built up a substantial working capital from rental of equipment and farm implements.

Around $6,500 has already been spent on purchase of equipment and farm implements. An additional $10,000 from district funds has been set aside to buy more equipment.

Spencer recently reviewed progress in the Sauvie district in this light: "Our district-wide drainage program, backed up with tested farm conservation practices, has developed a high level of productiveness on the island. Farm and community life has been stabilized and landowners are happy over their district's prosperous outlook."

BEAVERS (*Continued from page 2*)

brought by truck. They have done well, but arrived looking so battered and unhappy after their 500-mile ride that it was felt something better was needed. Therefore, when gullies on the Moreno Campo-Potrero Soil Conservation District called for beavers in 1946, the State *flew* the beavers in! Four Merced County beavers were taken from live traps in the morning, and released in San Diego County that afternoon. Three of the beavers were fat and sassy, and the fourth was fat but had temporarily lost his sass through a touch of air sickness. However, as a result of this trial, the State hopes in the future to make all long-distance deliveries of beavers by air.—RICHARD M. BOND.

CHAMP DOG, CHAMP CROP.—Bicolor lespedeza helped Satilla Sam win the National Amateur Field Quail Championship at Union Springs, Ala., early this year. Lester Varn's white and black pointer took the title from the large field of 53 starters. Varn is chairman of the Florida Game and Fresh Water Fish Commission.

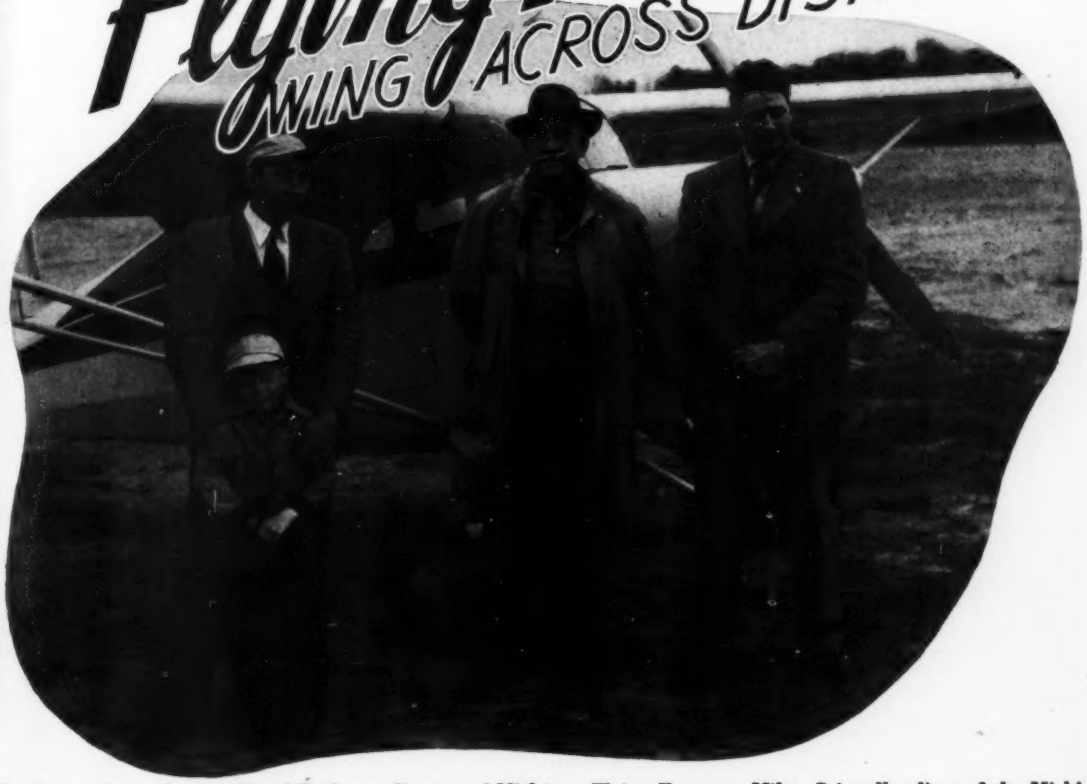
One of Satilla Sam's four covey finds was in a small draw at the edge of a bird strip planted in 1946, made of five rows of the new champion quail food—bicolor lespedeza. George Harden, manager of the Maytag plantation where the field trials were held, assures us that no covey had used that draw for many years. Bicolor turned the trick, as it has in dozens of other places.

In another planting made in 1941 on the same plantation, a covey (never present before), has wintered on the bicolor every year—until 1946–47. This year the bicolor plot held two coveys.—VERNE E. DAVISON.

THEY COME FROM INDIA.—Six officials from the Indian Government began a year's training with the Soil Conservation Service in May. From left to right: Dr. D. C. Kaith; Dr. A. G. Riaz; Dr. A. T. Sen; J. C. Dykes, Assistant Chief, SCS.; Dr. Grewal, Assistant Education Officer, Government of India, Washington; Dr. D. J. Gandy; William X. Hull, foreign liaison representative, SCS; Dr. S. P. Raychaudhuri; Dr. R. J. Kalamkar.

MORE LEGAL LIGHT.—Robert V. Wollard, assistant attorney general of New Mexico, at request of the State Soil Conservation Committee, has written an explanation of district law which is being sent to all supervisors, district offices and county agents. The author states that he follows "in many respects" an article by Governor Mickelson of South Dakota, in SOIL CONSERVATION Magazine for March 1947.

Flying Farmers WING ACROSS DISTRICT



Ready to take to the air: David Friday, a director of Michigan Flying Farmers; Milan Grinnell, editor of the Michigan Farmers Magazine; Lee Talladay, president of the Flying Farmers.

By WASHINGTON R. O'BRIEN

MICHIGAN'S flying Governor, Kim Sigler, met with 50 members of the Michigan Flying Farmers at Hartford, Mich., last May for the first soil conservation air tour ever held in the State. The visitors saw erosion and soil conservation in the Van Buren and St. Joe River Soil Conservation Districts.

The tour was arranged by E. C. Sackrider, State conservationist, and G. A. Thorpe, assistant State conservationist, in cooperation with Milan Grinnell, the editor of the Michigan Farmer, and Lee Talladay, president of the Michigan Flying Farmers.

Planes began to appear over the Hartford airport about 10 a. m., coming from north, south, east, and west. By noon practically all planes had arrived, some coming 200 miles. The press and radio were well represented by local papers, and arriving by air were staff members of the Michigan Farmer, the Detroit Free Press, the radio stations WJR, Detroit; WPAG, Ann Arbor; and WKZO, Kalamazoo.

A short business meeting was followed by a pot luck dinner, with local people furnishing coffee and sandwiches.

Governor Sigler then took over on the lee side of the airport hangar away from a biting northwest wind. Here he told the group of his interest in aviation, flying, and soil conservation.

Peaches, apples, and pears contour planted and terraced, on farm of Lewis Umphrey, of Coloma. Contour strip cropping in background.

Then came a 20-minute briefing and description of what would be seen on the tour by the district conservationist of the Soil Conservation Service. He was assisted by David Friday, flying farmer and farm equipment manufacturer of Hartford, who served as host.

Each flyer was given a map prepared by Jerry Mandigo, Van Buren County agricultural agent. These maps outlined the route and noted the points of interest in relationship to natural landmarks. A key on the sheet told what was to be seen at each spot.

Farm of Roy Butzbach, Bainbridge Center, shows frost pocket as dark area. Unsuitable for fruit, this area was reforested by the Soil Conservation Service with 13,500 red and scotch pine in 1937. The area surrounding the pines is set to a 2,300-tree terraced peach orchard, 500 of which are on closed-end terraces on sand. There has been no runoff since they were built. The heaviest storm they have had to withstand brought 3.4 inches of rain, 1.7 inches coming in 20 minutes.

NOTE.—The author is district conservationist, Soil Conservation Service, Benton Harbor, Mich.

Michigan Flying Farmers gather about their ships at Hartford Airport, to compare notes on flying and farming, just prior to take-off on tour.

The group of nearly 40 planes took off in single file, with Friday leading in his little red Cub. The planes were flown at an altitude of 1,000 feet, with all altimeters being zeroed in at the Hartford airport before the take-off.

The planes flew directly to the first stop, spaced about one-quarter of a mile apart. Here, as at each of the succeeding 13 points of interest, they circled to the left, letting down to 500 feet, and passing under the other planes as the circle was completed. Completing the circle, the lower planes climbed back to 1,000 feet and flew to the next stop where the procedure was repeated. The tour made a circuit of about 50 miles and lasted for about an hour.

Michigan's flying Governor, Hon. Kim Sigler, arrives to talk over farm problems with the flying farmers.

At the first point of interest the flyers saw the Efting Drain, the first drain with which the Soil Conservation Service assisted, in the Van Buren Soil Conservation District. Next, came the Byrd and Spellman blueberry plantation, where more than 100 acres of blueberries are planted in one block on poor land unadapted to other crops.

The Covert School, owner of a 40-acre block of land on which the school has started a reforestation project, was the third point of observation. Then came land destroyed by wind erosion and soil depletion, where grew the prize peaches shown at the International Exposition at Paris, France, in 1900.

The flying farmers then viewed the Van Buren County forest along Lake Michigan, where more than 50,000 pine trees have been set on a 200-acre tract. Skirting the shore of Lake Michigan north of Benton Harbor, the flying farmers saw Marvin's Slide, a large active sand dune thrown up by wind erosion. This active dune moves eastward at about 17 feet per year.

Spots 7, 8, and 9 were contour orchards coming in close succession near Caloma. John Miller planted a peach orchard on the contour in 1945, and Victor Friday also has a large block of peaches on the contour. On the Lewis Umphrey farm peaches, apples, and pears have been successfully grown on the contour. The grower formerly used square planting but lost too much soil because of erosion. Here also were sod waterways and contour strip cropping of general crops.

Cutting across country for the tenth point of interest, the flyers came to the farm of Roy Butzbach, Bainbridge Center, where 13,500 red and scotch pine were set in 1937 in a location too frosty for fruit. Around this planting were set 2,300 peach trees on terraces. Five hundred of the trees were set on closed-end terraces, on sand with no outlet. These terraces have had no run-off since 1937, holding a peak storm of 3.4 inches of rain, 1.7 inches of which came in 20 minutes.

Traveling on to Keeler, Mich., for the eleventh station, the flying farmers saw land completely destroyed by gullies. This land can no longer be farmed, yet when the Armistice was signed in 1918 the owner was getting 300 bushels of potatoes per acre.

The farm of David Friday next slid under the planes. Here vegetation is used for erosion control. A large block of contour peaches planted on plow-built terraces was seen from the air on the Geisler Brothers' farm near Hartford. The last point of interest was the Hartford Millpond on the Paw Paw River. High water, with 8.51 inches of rain in April, took out the dams at Hartford and Lawrence on the Paw Paw River. The heavy siltation in the old millpond could be seen very well from the air.

The planes took off for home without landing.

A Report to the Citizens

COVERING ITS ORGANIZATION AND PROGRAM

By

THE DISTRICT BOARD OF SUPERVISORS

Rocky Mount, Virginia

December, 1946

SPREADING THE WORD.—Can't get ahead of Blue Ridge! Noting the account of doings in the Lord Fairfax Soil Conservation District in the May issue of this magazine, the board of supervisors of Virginia's Blue Ridge Soil Conservation District has underwritten subscriptions to SOIL CONSERVATION Magazine on behalf of its own five members, the five county agents and the five SCS work unit offices within the area. Already on its toes, the district has resolved to keep that way!

The Blue Ridge district has recently issued an attractive, informative report of the sort it plans to get out at 5-year intervals, "to bring the general public up-to-date on the accomplishments of the district program." Three thousand copies are being distributed to farmers, civic leaders, and others, and plans are being made for a reprint of 5,000 copies which will be financed by bankers.

NOTE TO READERS.—I would appreciate postcards or letters telling me what ideas, practical help or specific values you have obtained from articles, illustrations, or news items appearing in this magazine. What kind of material do you find most useful and interesting?—WELLINGTON BRINK, EDITOR.

Drag line bites at main canal, while water eagerly seeks a way to freedom.

Milbank rescues Drowning Acres

By C. M. ELLERBE

JEREMIAH MILBANK, New York financier and owner of 21,000 acres of land in Jasper County, S. C., is pointing the way on his South Carolina plantation to the profitable use of some 3,000,000 acres of good "low country" soil in the State which has not been developed because of inadequate drainage.

When Milbank bought Cypress Woods Farms in 1939, it consisted of about 20,000 acres of pines and swamp, part of which was covered with water during much of the year. A heavy growth of hardwoods occupied an area of poorly drained land that at one time had produced rice. The previously cultivated upland fields were sandy and relatively infertile. As late as 1943, only 605 acres were available for production of feed crops and pasture.

After he had owned the land a few years, Milbank became interested in developing it into a farm that would pay its own way and in the spring of 1943 he made application to the Jasper County Soil Conservation District for a complete land use plan. The request for assistance was approved by the district supervisors and a soils technician of the Soil Conservation Service made a detailed conservation survey of the farm as the first step in developing the land use plan.

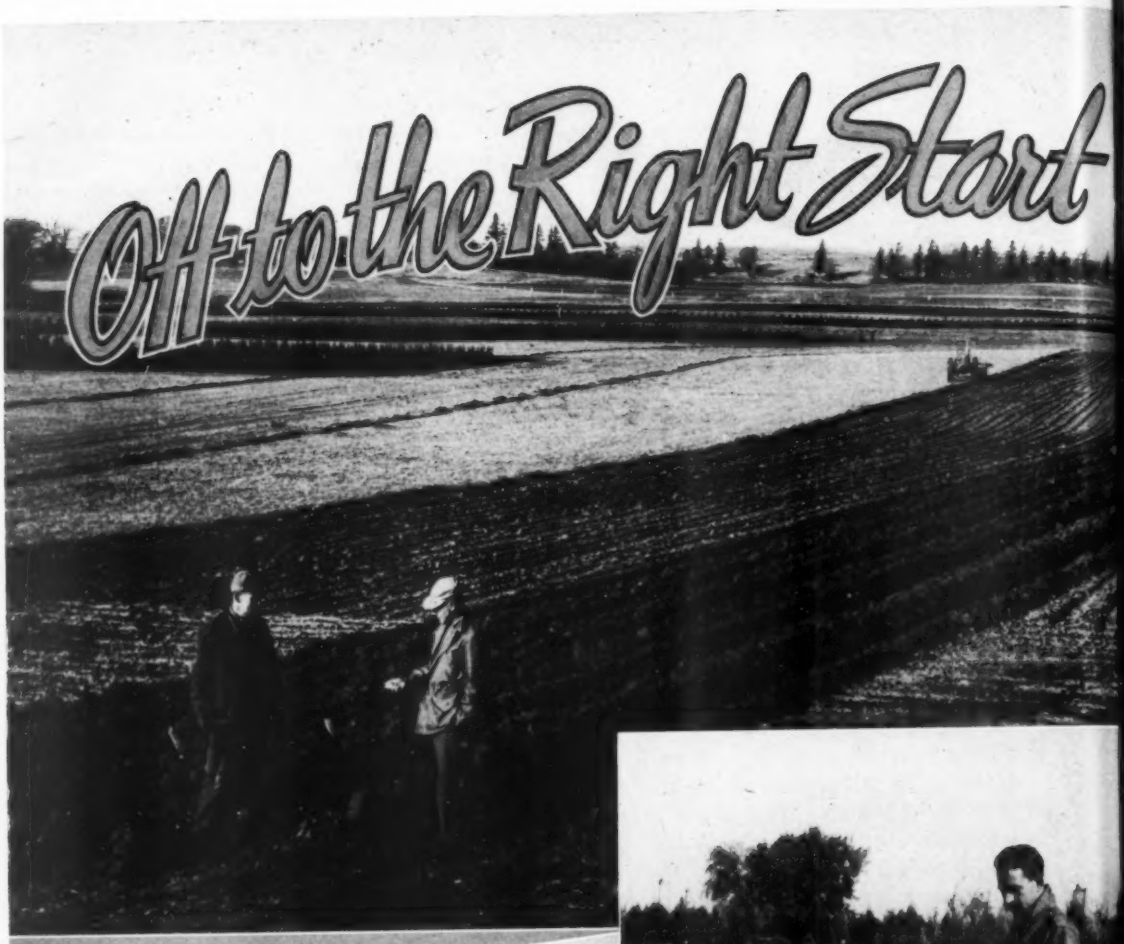
In making the survey, the soils technician walked over the entire farm, made soil borings at frequent intervals, and studied the physical characteristics of the soil. He then sketched the boundaries of the various soil types on an aerial photograph. He noted on the photograph the soil types, steepness of slope, degree and extent of erosion, and existing land use on every separately delineated area. This provided a conservation survey map of the entire plantation.

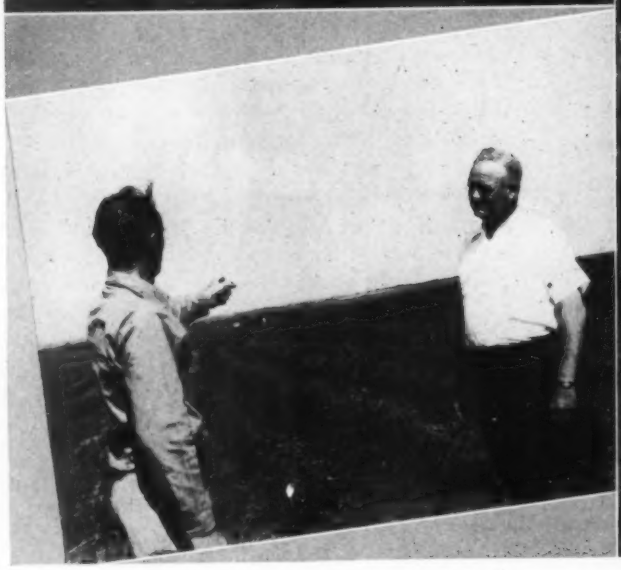
This inventory of the land capabilities served as a basis for preparing a well-balanced land use program. It revealed that the land being used for cultivation was sandy, droughty, and very low in fertility and could produce only submarginal yields of field crops and pasture grasses. The survey showed approximately 1,820 acres of these Blanton sands on the farm. Associated with this area of excessively drained sands were 3,600 acres of poorly drained Leon and St. Johns sands, having organic hardpans lying below plow depth which would interfere seriously with production of crops, and 600 acres of poorly drained Onslow

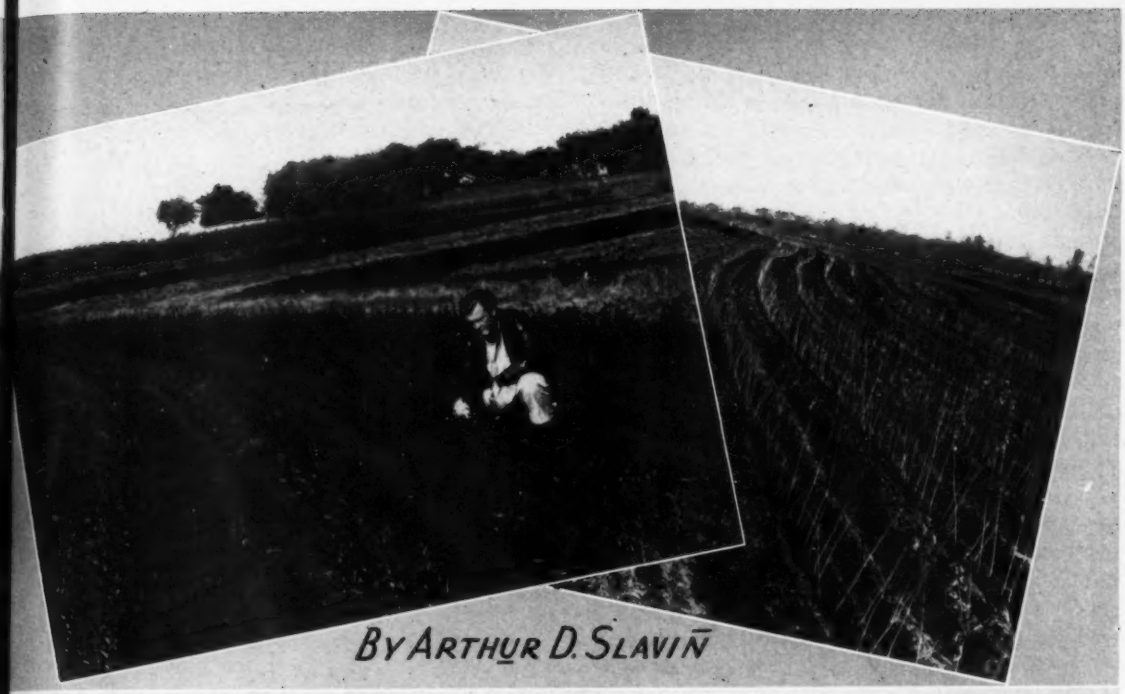
(*Continued on page 16*)

NOTE.—The author is soil scientist, Soil Conservation Service, Walterboro, S. C.

Off to the Right Start







BY ARTHUR D. SLAVIN

Top row, left to right.

Contour strip being furrowed prior to planting, in background alternate strips of nursery stock and grass legume stock; D. Hill Nursery Co., Dundee, Ill.

Henry Field Nurseries, Shenandoah, Iowa, grow privet on contour.

Terrace in Bailey Nursery, Newport, Minn., with apple trees on lower side and spruce on upper

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Bottom row, left to right.

Joseph A. Abrahamson, soil conservationist for Mount Arbor Nurseries, Shenandoah, and Harold Welsh, vice president, inspect contoured plantings.

Vertical rows in nursery invite erosion, just as they do on a farm.

Alternate strips of nursery stock and grass-legume sod check erosion on D. Hill Nursery Co., land. Area in foreground, too rough to cultivate, has been retired to permanent cover.

IT IS TRULY SAID that soil conservation is changing the American landscape. If you want to see new evidence of this continuing change visit some of the commercial nurseries in the midwest. During the past few years, nurserymen throughout the Corn Belt have undertaken soil-conservation work and many of them are among its most ardent supporters.

Corn, hogs, and livestock have pretty much set the argicultural pattern for the Corn Belt. Commercial nurseries are by comparison a highly specialized type of agriculture. They are even more than that, because the men who operate commercial nurseries are about as representative of the small business man as anyone you will find.

Recognized as an agriculturist, the nurseryman in his operations must be more than that. His physical set-up, labor, and special equipment needs place him in a position comparable to the small manufacturer. Because he cannot sell his product like the ordinary farmer through a common outlet, such as the grain elevator, stockyard, or commission house, he also must be a merchandiser. The nurseryman, a real go-getter, must combine the attributes of both the farmer and the business man.

If you want to know how he operates, ask the farm planners in about nine soil conservation districts scattered through Iowa, Illinois, Minnesota, Ohio, and Missouri. Invariably they will tell you that when it comes to getting conservation on the land he is about the fastest acting, hardest pushing type of individual that has so far joined in helping to guarantee America a permanent agriculture. Commercial nurseries in the Midwest are practicing soil conservation because they want to, not because they have been the target of any particular attention. In fact, until a few years ago soil conservationists had not given much thought to this type of agricultural enterprise.

IN 1941, the Page County Soil Conservation District in southwestern Iowa was beginning to get a lot of conservation on the land. At the same time the Mount Arbor Nurseries, located in the district, began to notice serious erosion losses on its 1,200 acres of nursery land. Harold S. Welch, executive vice president of the company, made two observations as he traveled about the district:

(1) Mount Arbor was suffering soil losses which were being reflected in poorer nursery crops.

(2) Other farms in the area were treating their land and were preventing soil loss.

The result was that Welsh applied to the district for assistance.

Starting on a small scale, the first work consisted of terracing and contouring several fields that were then being planted to nursery stock. After two seasons it was obvious that more than terracing and contouring would be necessary to do the job. In 1943 technicians of the Regional Nursery Division were called in to assist in the development of a complete plan. The author well remembers Welsh's remark at that time, "You don't have to sell us soil conservation. We know we must have it to stay in business. Just tell us what we need and we will do the job."

DESPITE the many problems which confronted the company during the war years, the job was done just as Welsh had forecast. The company not only installed conservation practices on its original 1,200 acres, but also has a program well under way on 600 additional acres acquired since the first plan was developed in 1943. This later development has been accomplished largely through the efforts of Joseph A. Abrahamson, formerly of the Soil Conservation Service, and now employed by Mount Arbor Nurseries as soil conservationist in charge of conservation activities. Today Joe is an important man on the Mount Arbor staff, and if you want to see him you had better make arrangements in advance. Even then Joe may have to cut short the visit—because he must catch a plane or train to Missouri, Texas, or one of the other States where the Mount Arbor Nurseries has production centers.

During the several years the Mount Arbor people have had their plan in operation, the nursery has become a mecca for nurserymen from other parts of the country. Today it is commonplace for nurserymen to ask, "Can you give us something like that at Mount Arbor?"

THE PLAN at Mount Arbor resembles a typical farm plan more closely than one might imagine if he is not intimately acquainted with nursery operations. Because the land at Mount Arbor is rich, fertile, windblown loess, terracing and contouring are a "must" on all slopes of more

NOTE.—The author is chief, regional nursery division, Soil Conservation Service, Milwaukee, Wis.

than 6 percent. Grassed waterways are also common. Probably most important of all is the fact that all nursery crops are grown in rotation with brome-alfalfa sod. The type of rotation varies according to land use capability and type of nursery stock grown.

Out in western Iowa, with its steep slopes and loessal soils, the value of such practices as contouring, terracing, and grassed waterways is obvious to anyone who has been in that area after a rain. Because I wondered how tangible a nurseryman might consider the effects of a good rotation, last fall I put this question to Welsh: "You mention the value of terracing and contouring but what do you consider you are getting out of your nursery stock-grass sod rotation?"

The reply was clear cut, Welsh said, 'Slavin, you remember that 22-acre field we seeded to brome-alfalfa in 1941. That field has produced apple stock for years. We didn't know it, but when we seeded that field down I didn't think of it in terms of future nursery stock. We were just going along with you and never expected to do much more than get a protective cover on that field. After 3 years in sod it looked so good that we broke the field and put it into apple stock. According to our figures that old, worn-out, eroded field produced the greatest percentage of No. 1 apple stock per acre that we've produced anywhere in the nursery during the last 18 years."

A YEAR AGO the development of a soil-conservation plan was started on the D. Hill Nursery Co., at Dundee, Ill. Recognized as the largest wholesale grower of ornamental conifers in the country, the Hill nursery operates 700 acres of land. Ornamental conifers are propagated almost entirely from cutting or by grafting done in the greenhouse. After the young trees go to the field, they are transplanted 2 or 3 times before being sold. As the Hill nursery keeps the stock in the field 3 to 4 years after the last transplanting, it will require about 7 years to get the plan into full operation. During the first year, however, application of conservation practices was completed on 270 acres. Because only conifers of about the same age class are produced, it has been impossible to follow a more or less uniform pattern of both rotations and practices on the entire nursery.

In brief, the plan on the Hill nursery includes a series of diversion terraces entering into an open drainage channel. The channel cuts through the nursery, following natural waterways which were formerly subject to much erosion. This open drainage is necessary because, in addition to handling run-off from the nursery itself, it must take care of a 360-acre watershed that lies outside the nursery. Between the diversions, which have an average spacing of 450 feet, contour strips approximately 100 feet in width are laid out. These strips are laternated in sod and nursery stock. Two rotations are used, depending upon the slope and existing erosion—N-N-N-N-S-S-S-S- and N-N-N-N-S-S-S. Areas where the topography is too irregular or the slope too steep for the production of nursery stock have been retired to permament grass or wildlife cover.

Because much of the beneficial effect of the sod in the rotation will diminish or be lost after the second year, the plan calls for top dressing all nursery fields with manure beginning the third year. At other nurseries, where stock sometimes remains in the field for 8 to 12 years, it is believed this practice will supply the organic matter necessary to maintain the soil in good tilth. Obviously in such long rotations it is essential that nursery stock be kept off of steep slopes, and even on gentle slopes of 5 to 10 percent adequate supporting practices must be followed at all times.

SEVERAL other procedures to reduce the hazards of long nursery rotations are being tried in various parts of the region. Among these are buckwheat or oats as winter cover crops, a smothering mulch of hay cut from the fields which are in the sod part of the rotation, and permanent seeding of shallow rooted grasses and legumes, including such species as bluegrass, fescue, white and Ladino clover. This does not mean that all nursery blocks are on the contour. At almost every nursery certain types of stock must be grown in straight rows to facilitate such operations as digging. The solution is to arrange the production plan so that the class I or more level land is assigned to this type of stock. It is interesting, however, to note that when a nurseryman starts on a soil conservation program he often estimates that as much as 50 percent of his stock must be grown in straight rows, but after a year or so of experience he will of his own accord put as much as 75 percent of his production on the contour.

BASED on the excellent results obtained by the Mount Arbor Nurseries, the Andrews Co. of Faribault, Minn., one of the leading small fruit

growers in the country, and the J. V. Bailey Co. of St. Paul, Minn., a large retail nursery, have made excellent starts toward developing conservation programs. Last fall the Jewell Nursery Company of Lake City, Minn., one of the largest wholesale nurseries in the Midwest, working with the Lake Pepin Soil Conservation District, developed a complete plan for the 750 acres which it operates. Ten days after the plan was completed, the construction of several terraces was started as the first step in applying the plan.

NOT TO BE OUTDONE by fellow nurserymen in Iowa, Illinois, and Minnesota, nurserymen in Ohio are now developing plans through their respective districts. Since January 14 nurseries in Ohio have requested assistance, with most of the work concentrated in Miami and Lake Counties, both of which are well-known nursery centers. Lake County, of which Painesville is the county seat, is the oldest and one of the largest nursery centers in the Midwest. According to the 1940 census, 54 percent of the agricultural income of Lake County was derived from nurseries and related business. Because they produce large quantities of materials known in the trade as finished stock and specimen material, much of the stock, such as conifers and shade trees, remains in the nursery block 6 to 12 years. This necessitates special attention to such treatments as winter and sod cover crops, manure top dressing, and mulches during the later years of the rotation.

Planning commercial nurseries in region 3 follows about the same procedures used in regular farm conservation planning. After the district receives a request for a conservation plan from the nursery, the regional nurseryman is advised, and a date is set to meet with the work unit conservationist and nurseryman. By the time this meeting is held the land use capability map has been prepared. The first step in the planning procedure is to meet with the nurseryman, or the group of nurserymen if applications have been made as a group. At this meeting the regional nurseryman, acting in the capacity of a planning specialist, explains what is meant by a complete conservation plan, and what procedures are necessary. Particular emphasis is placed on soil management. Supporting practices, including drainage where it is a problem, are also discussed. The nursery operator then outlines his set-up, including categories of stock produced, annual acreage needed, length of time each crop remains in the nursery, and any special production problems he feels he has.

Armed with this information, the regional nurseryman and the farm planner then rough out a plan that will do the job. This may require 1 or 2 days, after which another meeting is held with the nurseryman. At this meeting the generalized plan is discussed pro and con, and adjustments made to meet the particular technical problems and operating conditions of the nurseryman. The final plan is then prepared.

Because nursery work is highly specialized, fields or blocks, as they are generally known to the nurserymen, are often quite small. Sometimes they include less than 2 acres of land. For that reason, changing a nursery lay-out to permit such practices as contouring, terracing, or strip cropping may require a good deal of fitting and trying. Invariably a considerable amount of field work must be done before the final plan can be written up. The field work is done by the district personnel. It often happens that the final plan requires special consideration of certain nursery crops in terms of the over-all cropping pattern. In such cases the regional nurseryman makes a return trip, after the field work is completed, to assist the district personnel in the preparation of the completed plan. This procedure or regional office assistance is not as complicated as it may seem. Basically it is nothing more or less than the application of a training function. Thus we "kill two birds with one stone." We do a training job and at the same time get conservation on the land.

Although planning a commercial nursery looks pretty complicated at the start, there are few cases where the farm planners do not feel pretty well equipped to handle these jobs after they have had assistance on the first two or three plans.

DROWNING ACRES (*Continued from page 11*)

sands, which would be unproductive even if drained. Another area of 800 acres was found to be unsuited for crops because of flooding by streams.

On the other hand, the soils technician found extensive areas of potentially productive land which, if cleared, drained, and put into cultivation would produce high yields of food and feed crops. Altogether, there were some 13,000 acres of this land, the extent and exact locations of which were shown by the survey. It was then a simple matter for a planning technician to de-

velop a land-use plan that would adapt the type of farming operations desired to the capabilities of the land.

The farming program called for an increase in the herd of Angus cattle from 300 to 1,000 head, an increase in bronze turkeys from 5,000 to 15,000, and of Hampshire hogs from 300 to 1,200. In order to provide sufficient feed, it would be necessary to increase the cultivated land from 605 to 3,105 acres. It would also be necessary to increase the improved pasture to 1,000 acres. An area of about 2,000 acres of woodland was planned for intensive development for quail shooting, with approved forestry management on 15,000 acres of woodland.

To meet the requirements for food and feed crops, it would be necessary to develop a minimum of 2,500 acres of new land. An area of approximately 2,500 acres of extremely flat land on the western part of the farm was selected on the basis of soil types and their capability to produce feed crops. Bladen, Dunbar, Scranton, Portsmouth, and Bayboro soil types were predominant.

The surface soils classified as sandy loam to loam, varying in depth from 6 to 18 inches, and were underlain by clay and sandy clay mottled subsoils. It was found that they could be drained and were of a structure heavy enough to prevent excess leaching of plant food. Laboratory tests showed that the pH was about 5.0 and that the potash content was low. Good yields could be obtained from these soils with an application of 1 ton of lime per acre, 1,000 pounds of basic slag, and small amounts of potash.

To date, the number of cows has not been increased materially, because the pasture development program is still incomplete. But there are 600 hogs and 15,000 turkeys on the plantation and 40,000 day-old poults were sold last year to farmers in adjoining communities. These poults were produced in a modern, temperature-controlled hatchery under the most exacting conditions. A turkey dressing plant processes turkeys raised on the plantation and is available for use by other turkey growers in the county.

On 650 acres of newly developed land, an average of 30 bushels of corn and 40 bushels of oats an acre is now being produced. An additional 650 acres of land has been drained, cleared, and will be in production during the 1947 crop season. Eleven hundred acres of pasture are in various stages of development. Three hundred acres have received complete treatment, 200 acres have been cleared of underbrush, and 400 acres are being logged.

Although the job of readjusting the land use is not yet complete, Milbank is pointing the way on Cypress Woods Farms to the profitable use of some 3,000,000 acres of similar land in the low country section of the State.

Protecting Soils in the U. S. S. R.

By Professor-Doctor S. S. Sobolev, Dokuchaev Soil Institute, Moscow, U. S. S. R.

ABSTRACTED BY D. B. KRIMGOLD . . . TRANSLATED BY THEODORA MILLS

This paper was prepared for SOIL CONSERVATION magazine. It was submitted to the American Embassy at Moscow by the U. S. S. R. Society for Cultural Relations with Foreign Countries. Prof. Sobolev's article gives an account of the history and extent of erosion and of erosion control practices in the U. S. S. R. To make this interesting information available to nontechnical as well as technical readers, we obtained the author's permission to present an abstract of his paper in this magazine and to publish the unabridged version in one of the more technical journals. The article has been published in full in the July issue of the Journal of Soil and Water Conservation.

Prof. Sobolev is one of the leading soil conservation workers in the U. S. S. R. His report on snow retention, shelter belts, and the water and wind erosion data, included in this abstract, should prove particularly interesting to soil conservationists in the Great Plains and in the Northern States.—The Editor.

THE U. S. S. R. has been an agricultural country since ancient times. Its continental climate and dissected relief have contributed to the development of erosion. The first accounts of erosion in the Dniepr Basin date back to Herodotus in the Fifth century B. C. Ancient Russian documents and other sources of the Twelfth to Sixteenth centuries contain references to gullies, eroded soils and dust storms. Erosion developed,

chiefly, near fortified cities where the farm population sought protection from nomads.

The second period in the development of erosion began with the reforms of Peter the Great (1718) and the establishment of serfdom. Erosion developed rapidly in the overpopulated central zone and in the northern zone near Moscow, Suzdal, Vladimir, and Ryazan, but in the black soil zone, from which the Russian people were temporarily forced out by the Tartars, there were virgin steppes.

The third period begins with the liquidation of serfdom.

As a result of the reform, the center of agriculture for half a century (1861 to 1913) shifted to the black soil provinces. By the end of the period, according to the account of academician L. I. Prasolov, three quarters of all the land under cultivation was found within the limits of the black soil zone. The greatest damage was caused by gully erosion to which the small peasant holdings contributed, but *sheet erosion did not develop as seriously as in the United States where the proportion of row crops was considerably higher than in Russia.*

The fourth period, which began in 1917 after the October Revolution, is radically different from the first three. The land was nationalized and the small holdings were combined into large, highly mechanized, collective farms. After collectivization, the boundaries of the tiny peasant plots, which concentrated water from melting snow and rainfall, disappeared. The growth of gullies in a number of districts was retarded and, in some places, ceased altogether. *Deep plowing with tractor-drawn plows, correct crop rotations with perennial grasses, and improved practices—all contribute to the better growth of crops, which protect the soil from erosion, and to the formation of stable, crumbly soil structure. Surface run-off is decreased and the task of combatting destructive erosion is lightened.*

The U. S. S. R. is a tremendous country. The agricultural belt is characterized by a climate of the continental type, which sharply distinguishes the U. S. S. R. from the countries of Western Europe and from a large part of the United States.

The winter in the U. S. S. R. is long and severe with the ground deeply frozen and with abundant snow cover. *The rapid thawing of the snow in the spring and the heavy runoff of melting snow causes severe erosion and the growth of gullies.* In the south and southeast of the U. S. S. R., strong, dry, hot winds contribute to the development of wind erosion. Wind erosion in the winter is widespread in the U. S. S. R. During severe blizzards, the wind tears off the snow cover, destroys the soil and ruins winter crops over large areas. Snowdrifts mix with dust; this is why winters, with severe wind erosion, are called "black winters." Destructive cloudbursts, which erode the soil, are most frequent within the borders of the Ukraine and of Moldavia, in parts of White Russia, in the Caucasus, in Transcaucasia (Georgia and Krasnodar Region) and in the Far East.

The relief of Central Russia is sharply dissected with gullies and deep river valleys and is susceptible to erosion. In the central and southern belts of the European part of the U. S. S. R., about 125 million acres (about 35 percent of the arable land) are on slopes steeper than 3.5 percent; about 40 million acres are steeper than 7 percent; and about 15 million acres have slopes steeper than 10.5 percent. *The steepness of the slopes is not, however, the only factor* in the development of erosion; the shapes of the slopes are also important. The several types of slopes can be grouped into three basic forms: convex, straight and concave. When combined, these elementary forms give compound forms: convex-concave, and others. *Soil destruction is greatest on convex segments of the slopes, and least on the concave parts. In case of compound slopes; the steepness and length of the slope plays a less important role than the sequence of the adjoining segments.*

In wind erosion in the U. S. S. R. the following principles are recognized: *With the same soil cover, valley floors and depressions suffer the least while prominent relief features, such as "breaks," ledges of terraces and other so-called windswept slopes, suffer the most.* The damage from wind erosion is greatest on convex slopes, less severe on straight slopes, and least of all on concave slopes. The more abrupt the break of a cultivated, windswept slope, the more pronounced is wind erosion. Gradual changes in the rate of wind erosion are associated with gradual changes in the degree of slope. In 1934 the gullied area in the U. S. S. R. amounted to 11 million acres. *The annual loss from gully erosion, prior to 1917, was approximately one-fourth million acres.* In the arable plains of European U. S. S. R., approximately 74 million acres have suffered to some extent from erosion; about 27 of the 74 million acres have already been eroded and

to a noticeable degree have lost their fertility.

It is estimated that through water erosion about 247,000 acres of fertile land in European Russia are annually transformed into less fertile or, even, unsuitable waste land.

According to the calculations of academician L. I. Prasolov, there are in the U. S. S. R. 480 million acres of light-textured soils. Incomplete data indicate that by 1937, 36 million acres of these soils were destroyed by wind erosion. Assuming an annual increase of 1 percent, *the annual loss of arable land and pastures from wind erosion, prior to 1917, constituted approximately 360,000 acres.* Wind erosion has been especially destructive in the cattle country of Kazakstan and in the deserts of Central Asia. Here, out of 32.4 million acres of sandy and sandy loam soils, wind erosion has destroyed 18.3 million acres, or about 57 percent. Recently, problems of erosion have been seriously complicated by the rise of a new type of erosion—war erosion. The heaviest battles with the Germans were fought in districts where every break in the soil cover frequently leads to the development and growth of gullies.

PRINCIPLES OF EROSION CONTROL

In the U. S. S. R., the following erosion control and runoff retardation measures have found the widest application: (1) Snow retention and regulation of the runoff from melting snow. (2) Crop rotations with perennial grasses and improved farming methods. (3) Shelter belts. (4) Other measures, involving improved farming practices.

Ever since the middle of the last century, snow retention has been practiced with the use of mobile snow fences. (B. Titov, 1868): *On plowed fallow land, solid screens are placed on the contour,* to cause the snow to drift along the contour. The drifted snow acts like a dike or terrace; it retards the flow of water from melting snow and controls erosion. Extensive use is made of screens of sunflowers planted in double rows on summer fallow at intervals of 11.8 feet (the width of a tractor cultivator). The sunflowers are planted in the summer, which does not allow enough time for their stalks to become stiff enough to hinder the sowing of winter crops. The practice of interplanting colza or rape with winter grains for the retention of snow dates back to the end of the last century (I. Brounov, P. Kostychev). *Snow retention protects the soil from wind erosion; protects crops from winter kill; decreases the depth of freezing; raises the permeability of the soil; decreases surface runoff; and increases soil moisture.* Therefore, snow retention, which is one of the powerful means of controlling erosion, also, noticeably raises the yield of agricultural crops.

Run-off from melting snow is regulated in two ways; by utilizing the snow itself and by creating obstructions on the surface of the soil. In utilizing the snow itself, *the objective is to induce uneven melting of snow so that the thinner mantle between the snow ridges will melt earlier and the soil will thaw out sooner and will absorb some of the water, while the contour ridges of unmelted snow will intercept the runoff.*

Contour cultivation and contour ridging (terracing), basin listing and check-rowing have been employed by a series of experimenters (Shishka, 1840; Shishkin, 1873; Yankov 1891; Dokuchaev, 1894; Shalabanov, 1903; and others). Their studies showed that these methods often *increase the supply of available moisture in the ground 2 to 2½ times, and at the same time control erosion.*

Very great significance is attached in the U. S. S. R. to the improvement of the structure of the soil and increasing its resistance to erosion. Dokuchaev, Kostychev and, later, Williams emphasized the role of stable, crumbly structure of the soil in controlling erosion and obtaining consistently high crop yields. Along with good tillage practices, crop rotation with perennial grasses are of great importance in creating such soil structure. *Crop rotation with one or two fields of perennial grasses* are now being introduced everywhere in the U. S. S. R.; they are already being followed on an appreciable area. Special rotations, with three or four fields of perennial grasses, are used on areas with severe water and wind erosion. In arid regions, the rotations include five fields of perennial grasses; bare fallow and intertilled crops are largely eliminated.

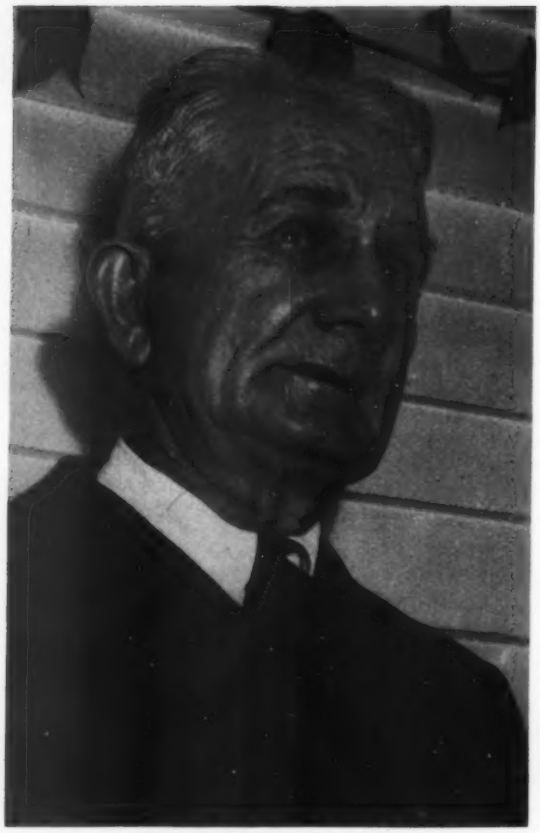
Shelter belts have been used in the U. S. S. R. since the beginning of the Nineteenth century. In 1809, Lomikrovskii began the first experiments on shelter belts. In 1837, he published a book, in which he set forth a sound system of woodland farming. *Before the war (1932–37), about 168,000 acres of shelter belts were planted annually on cultivated land in the U. S. S. R.* Over 64,000 acres of sandy soils and about 57,000 acres of gullies were being stabilized, and planted to trees annually. For the protection of cultivated land from wind erosion and drought, shelter belts of seven to eight rows in width are used;

Twelve years of observation at Kamenno-Stepnoi Experimental Station demonstrates that *the yield of rye on the fields protected by shelter belts is 18 percent higher than on the open steppe.* The favorable effect of the shelter belts is particularly pronounced in years of drought and of dust storms. Densely forested strips, 65 to 165 feet wide, are one of the means of stabilizing gullies. The purpose of these strips is to collect snow and to prevent water from melting snow from getting into the gullies. In addition to the usual hydraulic structures—flumes, drops, retaining walls, etc.—living barriers of willow stakes and tree planting in the beds of the gullies have been extensively used in the U. S. S. R. as far back as the Eighteenth century. Since the end of the Nineteenth century, *diversion terraces and diversion ditches* have been employed to prevent storm water and melting snow from reaching the heads of gullies. In addition to those described above, the following soil conserving practices are widely used in the U. S. S. R.:

(1) Plowing on the contour to a depth of 8 to 11 inches and deeper, which contributes to the absorption of melting snow,

(2) Plowing, cultivating, and planting across the slope,

(3) Strip cropping and reducing the width of cultivated fields on steep slopes.



Kentucky's Man of Action.

DISTRICT PROFILE

A. THRELKELD

"THE SPARK-PLUG," Kentuckians called this man.

In other states we have heard these fellows called "The spearhead — ramrod — go-getter — wheel-horse."

But regardless of what folks dub them, they are stepping out with a go-gettin' leadership.

Now, this "spark-plug" of the bluegrass, who is A. Threlkeld, president of the Kentucky Association of Soil Conservation District Supervisors, is one "go-getting" example.

What did he get? Plenty.

Back in 1944 when he heard of a soil conservation essay contest "down in South Carolina," Mr. A. scratched his head, didn't say anything, put gas in his car and headed for Louisville. He could speak for his association's board who had come to expect things from Mr. A.

"I've been down to Louisville and I saw Mr. Barry Bingham (president of the Courier-Journal, Louisville Times Publishing Co. and radio station WHAS) and he is going to sponsor the thing with us," he told his wife that night.

"What thing?" Mrs. Threlkeld asked.

"A soil conservation essay contest for Kentucky."

That year, Kentucky school kids showered Mr. A., Kentucky agriculturists, and the Louisville paper with 1,714 essays. Next year they swamped officials with 4,636 papers. And in 1946 Gene Hagan of the Monroe County district wrote his way to win against 8,968 entries, and tote off a $100 bond. Gene said, "Soil erosion is the No. 1 problem of Kentucky agriculture." The Courier-Journal, the Louisville Times, and radio station WHAS, offered $2,075 in savings bonds. An extra $2,712 was added by the county Farm Bureaus, boards of education, civic clubs, merchants, bankers, and district supervisors.

"We have had inquiries about this contest from Maine to Seattle," Mr. A. relates. "Teachers learned, too. Mrs. Lucille Brown of Dry Ridge School told me, 'I found out more about soil conservation in judging those papers than I ever dreamed about.'"

Mr. A. stroked back his white hair, looked at us with his deep, Abe Lincolnish eyes, and dropped us a bit of wisdom. "You can get better results with direct contacts," he said, "than with the mails. You have got to sit down and talk with people to get things done. And you have got to carry them and show them. People see these things changing and they are convinced. All the mail and everything wouldn't do it. Let 'em see it and they will believe."

However, Mr. A. does write letters. To make better use of the aid of the Soil Conservation Service, he and several other supervisors took the lead for a State association and sent letters to the 450 supervisors of Kentucky's 90 soil conservation districts asking them to meet at the University of Kentucky livestock pavilion, where the State Association of district supervisors was formed.

But, merely organizing wasn't enough—Threlkeld leadership was plus stuff. "We had an organization," Mr. A. said, "but, we didn't have any

funds to operate on. We couldn't ask the State to allocate funds to us, because our association wasn't a legal part of the State."

Mr. A. called together the directors of the State association. Framework for the new State division of soil and water resources was born. The State legislature adopted it. A commissioner was provided, from each congressional district, who had to be a district supervisor. The soil conservation districts in each congressional district were to nominate 2 supervisors, 1 from each of the 2 major political parties. And from the list of 18 the State Commissioner of conservation would appoint 9, not more than 5 of whom could be from any one political party. "We wanted to keep politics out of it," Mr. A. said. The commission has employed Marshall W. Qualls as their full-time executive director.

Purpose of the commission is to assist districts in getting conservation on the land.

Per diem for supervisors when attending local meetings is provided, also, $60 per year miscellaneous expenses for each district. The 1948 fiscal year provides $136,000 to be granted to districts for soil-conservation equipment and used by the commission for other purposes.

"This equipment money," Mr. A. declares, "is inspiring more interest among supervisors than anything, ever. It is bringing them to realize that it is their duty to see that the soil program goes over. They have got to act on spending the money, and when a man acts he gets interested. We are telling them, 'You are supervisors, this is your responsibility'."

On July 1 and January 1, Kentucky supervisors get out the four-page Kentucky soil conservation News Bulletin which carries the better-soil drive from the State association of district supervisors.

Another activity, the State association encourages local leadership with master conservationists awards. A district cooperator may qualify "By having all practices in the farmer-district plan established on his farm and by being recognized as a leader in soil conservation."

We are sitting here at Threlkeld's (he spurns bouquets, says all the supervisors should be credited), we are in this country where the Ohio makes that big hump in the northern Kentucky outline. Mr. A. watches a blizzard raging outside; night is coming, and we rise to go before we are snowed in. "We've got another contest coming up," Mr. A. spoke. "One for the contestant who, during the contest period, makes the most progress in establishing a conservation program on his farm. First prize is $250. Second, $150. And third, $100. Certificates of award will be presented to first-place winner in each soil conservation district."

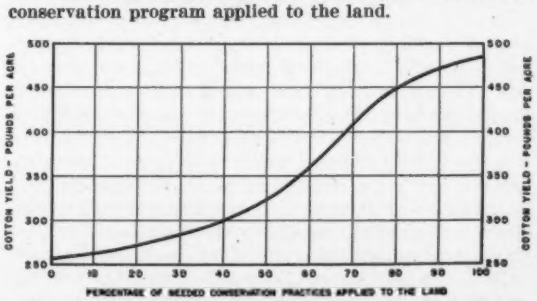
Mr. A. is one of the 9,000 district supervisors in America who are sacrificing badly needed time from their own farms and ranches to help their fellow men, working without pay because they believe in soil conservation. This year Mr. A. flew to Chicago to help organize the permanent national association of districts.

Mr. Threlkeld is president of the northern Kentucky PCA, a commissioner and vice chairman of the Division of Soil and Water Resources, the president and director of the State association of soil conservation district supervisors, chairman of Grant County, Soil Conservation District, board of supervisors, a director of the National Association of Soil Conservation District Governing Bodies, a director of the Kentucky Burly Tobacco Growers Cooperative Association, and an elder in the Christian Church.—JOHN MCKINNEY.

MORE CONSERVATION—MORE COTTON.—The accompanying chart shows the relation between cotton yield and the amount of needed conservation practices applied to the land. It is based on survey records of 300 cotton farms in the Southeast where application of conservation practices varied from 0 to 100 percent. The 300 farms were selected at random from groups comparable in size, soils, topography, cropping practices, and land capabilities.

The study showed that while it takes time to get a conservation program going, the effects accumulate as more and more practices are applied, until yields begin to level off as the plan nears completion. Farms with a conservation "score" of 20 had yields only slightly higher than those with a score of 0. From 20 to 50, the increase in yields was fairly rapid. Between 50 and 80 the greatest increase occurred. After the score passed 80, the yields continued to go up, but the increase was less pronounced.

These results emphasize the need for a complete soil conservation program applied to the land.



NOTE.—Data prepared by De F. Hungerford and Robert W. Andrews, regional project plans division, Soil Conservation Service, Spartansburg, S. C.

REVIEWS

TOMORROW'S FOOD. The coming revolution in nutrition. JAMES RORTY AND N. PHILIP NORMAN, M. D. PRENTICE HALL, 70 FIFTH AVENUE, NEW YORK 11, N. Y.

"Tomorrow's Food" lives up to the title very well in bringing the reader to face the future problem of food, not only in terms of quantity, but more so of its quality, which means health. The authors have done well in digesting the scattered, and less commonly read, technical works of excellent authorities. They have put into interesting and challenging reading an able interpretation of these different parts of the more complete picture.

Rorty and Norman have developed the broader subject of food from the ground up. Their first premise is that food should be the basis of good health. Good food is disease prevention to them. They cite primitive folks whose natural foods, grown on carefully conserved and well-manured soils, have made unusually healthy and vigorous bodies. They cite cases from the studies by McCarrison and the extensive travels and detailed records of Dr. Weston A. Price, who found many primitive peoples with such sound teeth that for them the dentists had taken a holiday.

According to the authors, our food problem is economic, social, and political, as well as nutritional. The draft rejections—188,000 for defective vision alone, out of the first million—and surveys during depression times reporting that 75 percent of the people of America, especially those in the low-salary bracket, are malnourished, are taken as indicators of poverty as the close associate of this unfortunate nutritional situation.

As a people we have taken on perverted food habits. We have brought on troubles in reproduction suggesting that we must look to better food for better babies. But with better food there must come some changed social practices as well. Scientific helps need to be called to our aid for food as health rather than food for profit only. "Food perversion," as the authors call it, is given a frank and honest presentation. Industrial conversions of our foods, too little of them taken in natural form, and our readiness to lean on drugs and artificialities, are basic troubles. "There are many more nutrients in natural foods than the synthesizers have synthesized, and the deficiency (*in the health of a person*) may arise from the lack of one or more of these natural unknowns. Usually the patient is suffering, not from one deficiency, but from several; and always what is involved is a complex interrelationship of vitamins and minerals . . ." For the authors, and one of them is an M. D., food quality must be grown into it from good, fertile soil, and cannot effectively be thrown into the diet by the apothecary's shop.

Domestic animals know their food quality and such animals can be used in their feed choices to detect soil deficiencies. We had to let rats show us that they have the "ability to choose a balanced diet without help of national nutrition programs, advertising copy writers, home economists, dieticians, or nutritionists." "Poor whites" in the South eat clay to cure anemia. Pregnant Negro women with low hemoglobin levels travel long distances to gather "stump dirt," this being a kind of iron-bearing clay found where a tree blows over and brings the soil to the surface.

Our perverted food habits, our emphasis mainly on calories, our purchase according to bulk, and our submission to propaganda and advertising, have not given us the wholesome, freshly ground, whole-wheat bread. Instead, much has been milled out, and then the flour values supposedly restored by "enrichment," only to let us lean on the "broken staff" of life. "Profit motivations, then, intensify the biologic wreckage already wrought by soil exhaustion." All of the factors, economic, social, agricultural and otherwise, disturbing the quality of our food are fairly and forcefully presented in giving answer to the question "what's wrong with American food?"

That our food problems are not hopeless and insurmountable is the theme of almost half of the book. The sciences, agriculture, processing, labelling, and distribution of food can all be tools of liberation from self-wrought bondage. Already pilot-plant performances, and trial areas are pointing the way. At the very foundation are the soil and its exploited fertility.

Carbyhydrates are easily grown, and often serve to exaggerate the crop's output as bulk, all economically enviable, but nutritionally damnable. If soils are to produce protein in abundance they must be built up in fertility. Carbohydrate conversion into proteins is inefficient when "an acre of grains, sugarbeets, potatoes, or other carbohydrate-producing crops will give only 70 pounds of protein in the form of milk or beef after it has been fed to cattle, and yet this same carbohydrate used to produce yeast gives 840 pounds of equally good protein." We might well add that soils commonly growing sugar that were given proper soil treatments, such as fertilizers, and put to grass, have been known to produce almost a ton of beef per acre. Soils fertile enough to grow alfalfa will synthesize as much as 1,500 pounds of vegetable protein per acre per year in this crop for animal feed or harvest. Agriculture is, after all, the starting point of, and the hope for, the solution of our food problems; and the soil fertility is the determiner of the nutritional quality of the creations of this great outdoor industry.

The authors make a strong call for some crusaders today as we had them in the past. Muckraking, once liquidated, might well be restored to revivify "free enterprise" as a vital American reality. Labeling and processing call for reworking in the light of our better health information and under the vigor of a former Dr. Wiley, and in the public spirit prevailing before the scientists sat so regularly at the same table with the banker and the industrialist.

The Blitz of the Britons left them with better health after the war's end than in 1939. It came from the planning by all forces. Our planning the food of tomorrow calls first for the scientists who are not afraid to give a minority report. Even then, after food fundamentals are accepted in principle, much needs to be done to feed people well. Here may need be some revolutions in processing, and distribution, not only on a national, but on a

(*Continued on page 23*)

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REVIEWS (*Continued from page 22*)

global scale. "It is for the food and agricultural organization of the United Nations to assert the mastery and fulfill the hope, that hunger and war must be banished from the stage of history.

Anyone will read Tomorrow's Food as a stimulus to his own thinking, whether or not he agrees with all it presents. The reader will see tomorrow's food as a problem in agriculture, and as plenty of reason for more concern about the soil fertility as basis for good nutrition. He will appreciate the political implications of tomorrow's food problems that were already familiar to Seneca, that famous writer of Roman times, when he said "A hungry people will not endure reason, they will not listen to justice, they will not bend to any prayer for mercy."—W. A. ALBRECHT.

SOIL CONSERVATION
AND
FARM MANAGEMENT

"MAN is the product of his environment." This old quotation applies perfectly to the modern farmer who practices soil conservation.

It has been my observation that conservation farmers usually become better all-around farm managers. Some folks have tried to differentiate between conservation farming and farm management. They say, for instance, "These are conservation practices, and these are good management practices." I think they are mistaken. Certainly, the development of a conservation program is the first, basic, step leading to a complete plan of management for an entire farm unit. Once such a plan is put in effect on the land it becomes a sound and enduring foundation upon which to build a better livestock program, a workable financial plan, crop improvements, and all the other phases of good farm management. It is equally true that the full benefits of a conservation farm plan will not be realized unless the other elements of good farm management are also brought into play.

I have noticed that farmers who have taken the first step of planning their farms for conservation usually take the next steps leading to a complete management plan. As the adoption of conservation steadily improves and safeguards the productive capacity of the land, the next logical step is to use improved varieties and strains of crops that will more fully utilize that productive capacity. When pasture fields provide feed all season long, when the hay contains legumes, and there is plenty of feed with some left over, then indeed there is real inducement to improve and increase the livestock. The added business thus made possible is on a sound and continuing basis.

Once a conservation plan has been put into effect the farmer is no longer worried over such questions as, "Shall I buy that new improved strain of seed—or would it wash out?" "If I apply limestone and fertilizer, will my crop yield enough more to pay for it?" "Will it pay me to buy some better cows with the feed I have available for them?" With a conservation plan on the farm he can move ahead with confidence that his crops will not be washed out, that his yields will be good, and that the quality of his feed will be high.

One of the marks of a good farm manager is doing things on time. He contrives to get his crops in when they should be planted, and to harvest them when they are ready. No matter how carefully these operations may be timed, the weather often interferes. But the conservation farmer who has planned his operations to fit his land, who has developed an effective system for the management of water, and has supplemented these with the necessary soil and water conservation practices, has greatly reduced his chances of delays because of weather. He will often be able to work his land days earlier than otherwise. His crops grow better and mature faster, once they are planted. And when harvest time comes around his equipment will not bog down in a wet spot or be broken in crossing a gully. Thus, his conservation plan has helped him to get things done on time—to be a better farm manager.

Yes, truly, "man is the product of his environment." If he continually gazes upon a landscape scarred by gullies, fields stripped of productive capacity, pastures that are little more than exercise lots under the hot summer sun, he is almost sure to lose his desire to think ahead and plan improvements. On the other hand, when he sees the results of his conservation planning spread upon his fields, pastures and woodlots, he is inspired to move forward, to seek better things for himself and his family. I have observed that conservation farmers usually become better all around farm managers.

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